

Historic, Archive Document

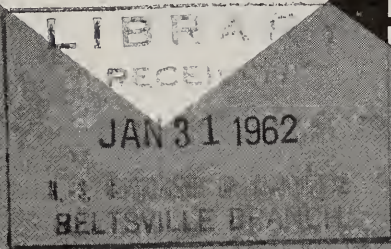
Do not assume content reflects current scientific knowledge, policies, or practices.

Ag 8

agricultural

marketing

JANUARY 1962



Be It Enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby established at the seat of government of the United States a Department of Agriculture, the general design and duties of which shall be to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants.

A. Lincoln



UNITED STATES DEPARTMENT OF AGRICULTURE • 1862-1962

Contents

January 1962

The Demand for Farm Products	3
Changes in Marketing Costs and Services	5
1962 Prospects for Overseas Markets	6
Trends and Prospects for Market Development	8
The Best Way to Kill Stored-Grain Insects	10
Rhodesia Tobacco in World Markets	12
Improving Processing of Ready-to-Cook Chickens	14
A New Step Toward Quality Grape Exports	15
Record Keeping Important for Livestock Dealer	16
Walking Costs Money in Wholesale Warehouses	18
A Market Pricing System Geared to Wool Quality	18
Malathion Prevents Infestation in Stored Corn	19
One Man Handling Unloading Equipment Cuts Costs	19
Food Is a Bargain—Here's Why	20

Reprint material

All articles may be reprinted without permission. Prints of photos and art used in this issue can be obtained from Photo Library, U. S. Department of Agriculture, Washington 25, D. C. Photos are identified by the following negative numbers: Page 3, AAA15000 (top), N37582 (bottom left); p. 5, top to bottom, N24412, N24411, BN9762; p. 8, N18549 (top); p. 9, N39511; p. 12, *Courtesy of TOBACCO*; pp.16 and 17, left to right, N32477, N34462, N32531, N26682; p. 18, N35587.

Cover page

A hundred springs and autumns, and their fruitful harvests, now lie as quietly in the pages of America's history as the dust of the full century which has passed since President Lincoln's immortal pen created the United States Department of Agriculture on May 15, 1862.

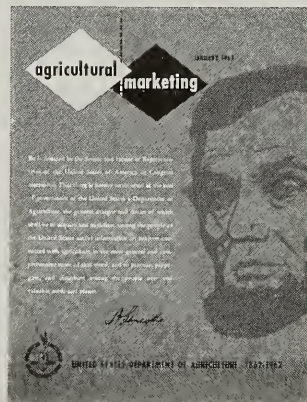
In that century America's agriculture has indeed come a long, long way, and has set an enviable pattern of accomplishment for other countries of the world to attempt to equal. Our agricultural production has met every need of Americans for food and fiber not only at home, but abroad, in war and in peace.

When President Lincoln signed this Act one American farm worker was producing enough food and fiber for only 5 people. Today, one farmer can feed 26 people. Our citizens are better fed and clothed than ever before, and American agricultural research is benefiting every person in every walk of life.

Editor, MILTON HOFFMAN

Assistant editor, DANIEL W. HICKY

AGRICULTURAL MARKETING is published monthly by the Agricultural Marketing Service, United States Department of Agriculture, Washington 25, D. C. The printing of this publication has been approved by the Bureau of the Budget, March 18, 1959. Yearly subscription rate is \$1.50, domestic; \$2.25, foreign. Single copies are 15 cents each. Subscription orders should be sent to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



THE DEMAND FOR FARM PRODUCTS

by MARTIN J. GERRA

PROSPECTS for rising consumer incomes and population gains should assure the nation of a strong domestic market for farm products during 1962. And continued large exports of our farm products are expected to provide welcome additional outlets. These projections for 1962 were made by USDA's Economic Research Service.

At home, economic activity this year is expected to be bolstered by further increases in business outlays for new plants and equipment, government spending, and accelerated consumer buying. The indicated effects on demand will push the economy's gross product up around 8 percent above 1961's third quarter rate of \$526 billion. Such an expected pickup would take up much of the slack in the economy without significantly increasing the general price level.

Economic recovery from the 1960-61 recession is about average so far, but a relatively high level of unemployment still remains. This most recent slack in economic activity was the fourth mildest, and shortest recession of the postwar period.

(continued on page 4)



Demand for Farm Products

(continued)

While real disposable income per person declined slightly during the 1960-61 recession, it rose 2½ percent from the first to the third quarter of 1961, giving consumers an estimated annual sum of \$386 billion to spend on food and other goods. Chances are, real consumer incomes will increase by about 3 percent this year from 1961.

ACTUALLY, population is the most important factor in demand and especially in the demand for food. U.S. population growth is increasing the number of customers for farm products at a rate of about 1.7 percent per year. This added about 3 million more people to our population during 1961.

USDA's food distribution programs are another element in the domestic food consumption picture. They include the Plentiful Foods, National School Lunch, Special Milk, and Direct Distribution programs and the Pilot Food Stamp Project. Currently more than 24 million people are benefiting from Direct Distribution programs.

Both domestic and foreign developments are expected to contribute to a high level of food exports in 1962. The dollar value of agricultural exports for the year is predicted to be around the record \$5.1 billion mark expected for 1961. Major reasons are high levels of economic activity in western Europe and Japan (our leading foreign outlet), record gold and dollar holdings in many countries trading with us, and the Nation's accelerated Food for Peace Program.

For the current year ending in June, exports of wheat (including flour) are expected to reach a new high. Meanwhile, exports of oilseeds and related products, fruits and vegetables, and animal products are also likely to be higher than a year earlier. Cotton exports, though, are expected to be under 6 million bales, as compared with 7 million in 1960-61, while unmanufactured tobacco exports may show a small decline from last year's 504 million pounds.

These strong domestic and foreign requirements for farm products will be met with abundant supplies of livestock and food crops. Larger marketings of animals and their products are in prospect, but crop marketings are expected to be smaller.

The uptrend in livestock production is expected to continue this year, and result in larger marketings, particularly in hogs, cattle, and dairy products. But the Feed Grain Program, which is again in effect, along with a similar program for wheat, will limit crop output for 1962.

With these production changes, the outlook for prices of farm products this year points toward little overall change from the average level of 1961. An expected rise in crop prices, though, is likely to be about offset by some further decline in livestock prices. It is assumed that present farm programs and support prices will continue.

The currently improved farm income situation reflects larger cash receipts from marketings, increased government payments for the 1961 Feed Grain Program, and some advanced payments from the 1962-crop Wheat Program.

The rise in farmers' cash receipts for 1961, which is expected to be about 2 percent above the \$34 billion total in 1960, stemmed from a record volume of marketings. Farm prices for 1961 had, on the whole, remained close to the 1960 level. Most of the gain in receipts was from meat animals, dairy products, soybeans, tobacco, cotton. In addition, government payments to farmers added about \$900 million to gross farm income. These gains pushed gross farm income close to \$40 billion in 1961.

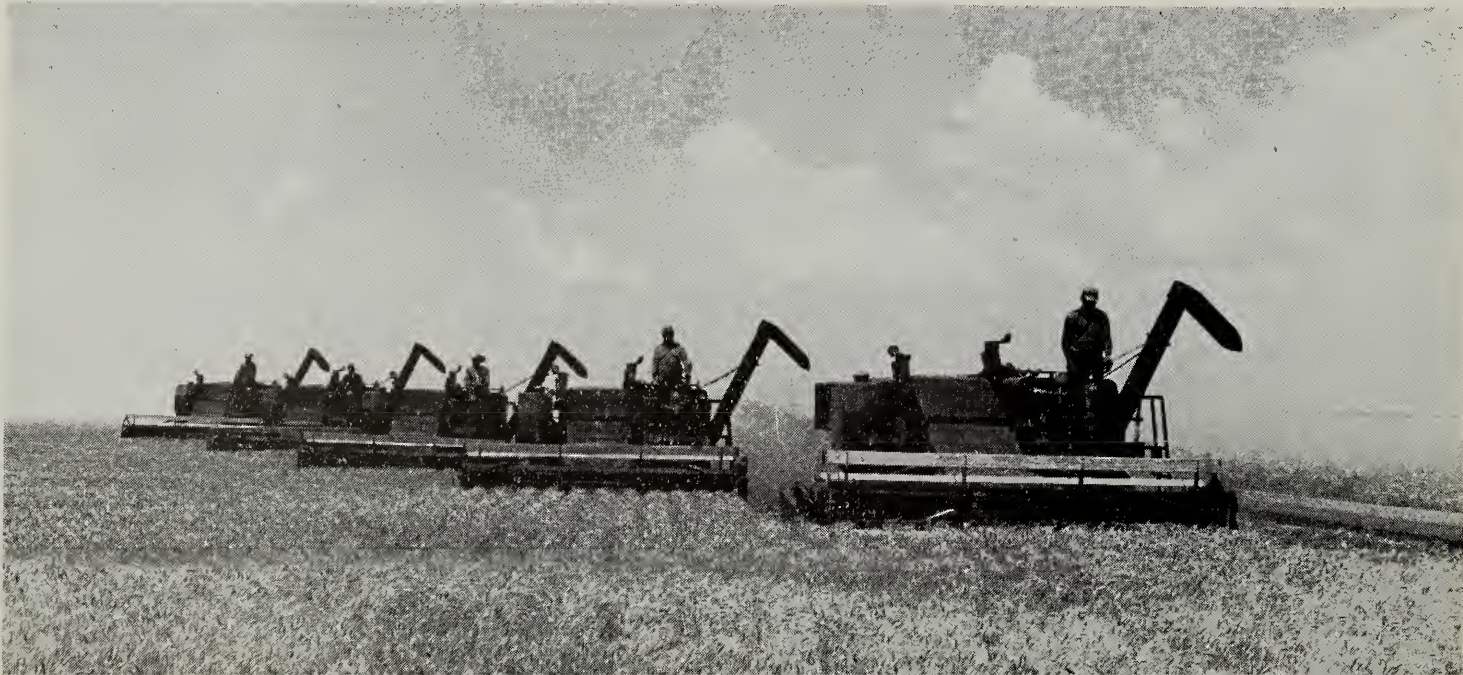
Prices paid by farmers for production items including interest, taxes, and wage rates, showed only a small increase in 1961. When final figures are in, production expenses may total \$27 billion. Part of the gain in gross income, therefore, would be offset, leaving an increase in realized net farm income of about \$1 billion.

For 1962, total cash receipts from the marketing of farm products may change little from this year. Assuming active participation in government programs, payments to farmers are expected to increase over last year. However, farm production expenses will rise—although probably a little less than last year—and realized net farm income is expected to continue near the improved level of 1961.

These facts should make encouraging news for the American consumer. For food supplies will be generous, real consumer incomes are expected to rise, and average retail food prices are likely to increase only slightly.

The author is Head, Demand Analysis Section, Outlook and Projections Branch, Economic Research Service, USDA.

Agriculture has made an impressive record in past century. In 1862, one farmer produced food for 5 people; today, he produces for 26.



CHANGES IN MARKETING COSTS AND SERVICES

THE SPREAD between farm and retail prices for food widened slightly in 1961 and will probably continue to grow in 1962, according to USDA's Economic Research Service.

For 1962, predictions point to a small increase in marketing costs but no increase in the farmer's prices. Retail food prices, though, will be slightly higher. The rise in marketing charges follows the upward path of the last decade—a 32 percent increase in the marketing spread from 1950 to 1960.

What about the charges that add up to the marketing spread—what has happened, and what will happen to them?

The most important charge is for labor—an item that accounts for half the marketing spread. Hourly earnings for food marketing employees rose 60 percent from 1950 to 1960; however, labor costs per unit of product increased only 24 percent. To put it another way: output per man-hour increased as much as 30 percent in some parts of the industry.

Not all the increase in average hourly earnings for the food industry, though, can be traced to wage rate increases. The use of more expensive skilled labor also contributed to the rise. Labor costs have gone up in other industries too, some of which supply the food industry with goods and services. And additional fringe benefits also added to labor costs.

Hourly earnings are likely to continue to rise in 1962, probably by around 4 percent. However, increased productivity should offset some of the increase. The more efficient use of labor, and the adoption of advanced models of equipment, should continue to speed operations and check the rise in costs of processing, handling, and distribution.

Transportation costs between cities amount to about 10 percent of the marketing spread. Rail freight rates for agricultural products increased 17 percent in the 10-year span between 1950 and 1960. However, indications are that transportation rates dropped a little in 1961 and may decrease again in 1962. Improved efficiency in transportation methods has helped to keep costs down. For instance, railroads are packing heavier loads into cars and

adopting higher capacity equipment to get lower costs per unit shipped.

Prices of goods and services bought by marketing firms rose considerably during the last decade and will probably inch up a little next year. For example, prices of machinery and equipment increased 55 percent from 1950 to 1960; fuel oil rose 26 percent; coal, 13 percent; and construction costs, 34 percent.

Other costs also took the upward trail. Interest rates rose adding to the bills for marketing firms. Increased advertising and more expensive forms of product promotion have also added to costs. State and local taxes, rents, and other overhead also moved up. Some of these rising costs, though, have been offset by increased efficiency in business operations.

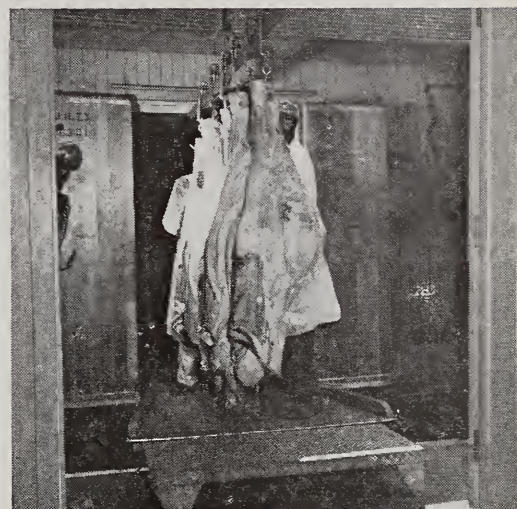
In some instances, however, integration in the food industries has shortened marketing channels and reduced marketing costs. For example, large grocery chain organizations have bypassed one or more of the traditional handling agencies.

On the retail end, an increase in the “extras” the customer now takes for granted when she goes shopping has also added a little to food marketing costs and helped to widen the gap between farm and retail prices. For instance, consumers want such additional services as warm-and-serve items and improved packaging. They are also buying more meals away from home.

Food stores today are buying more advertising, also offering trading stamps and premiums. They are also building larger and more elaborate stores to attract and hold business. Supermarkets are stocking more nonfood items for one-stop shopping convenience. All of these developments, of course, can add to the cost of marketing.

Even though the retail price of food has moved up, the American consumer can now buy more food and better quality food than ever before. Consumer incomes may well continue to come, after taxes, for food in 1961, but 10 years later, by 1961, they were spending only 20 percent.

Expectations today are that consumer incomes may well continue to keep ahead of the rising cost of marketing and the overall cost of food.



Unloading beef from railroad cars. Transportation costs between cities amount to about 10 percent of the marketing spread.



Labor accounts for half the marketing cost. Hourly earnings rose 60 percent from 1950 to 1960; output per man-hour increased 30 percent in some parts of the food industry.



In recent years, agricultural exports have accounted for about 13 percent of our farm marketing income.

1962 PROSPECTS FOR OVERSEAS MARKETS

by ROBERT L. TONTZ

NEW RECORDS are in prospect for U.S. agricultural exports in the fiscal year ending June 30, 1962. Their value is expected to reach \$5.1 billion, slightly above the \$4.9 billion for the fiscal year ending June 30, 1961. Although part of this increase will reflect higher export prices for cotton and certain grains, volume also is expected to set a new record in 1961-62.

Both foreign and domestic developments will contribute to the high level of exports. Economic activity in Western Europe and Japan continues to advance at the rapid pace of recent years; gold and dollar holdings of many of the trading partners of the United States are being maintained at record levels; and some further progress has been made on lowering trade barriers against U.S. products.

On the domestic side, there are plentiful supplies of high-quality farm products available for export. Moreover, the export payment-in-kind pro-

gram will assist the United States in competing more successfully with other major producers in a number of world markets, such as those for cotton, wheat, rice, and feed grains. For the newly developing countries which are short of dollars, the United States will make farm products available for sale for foreign currencies, primarily under Title I of Public Law 480.

U.S. exports for dollars in the fiscal year 1960-61 totaled \$3.4 billion. They represented nearly 70 percent of all U.S. farm exports in that period. Remaining U.S. exports were under Government-financed programs (P.L. 480 and P.L. 665). They equaled \$1.5 billion in the fiscal year 1960-61.

Some two-fifths of dollar sales and roughly two-thirds of the Government program exports—or about half of all exports—were given assistance principally in the form of export payments by the Government.

U.S. exports of wheat (including flour) are expected to exceed last year's record of 662 million bushels. In fact,

a new high of 675 million bushels is presently estimated for the current fiscal year. Wheat production in Western Europe declined about 100 million bushels in 1961, compared with the previous year, and that area will have to import substantially more wheat in the current season to make up for its reduced production. The United States is expected to share in the larger exports to this area. U.S. wheat exports under Government programs (P.L. 480 and P.L. 665) will likely continue at about last year's record level, with the bulk of the shipments going to Asia.

Cotton exports are likely to be down approximately a million bales from 1960-61 shipments of 7 million bales—the second highest year in over a quarter of a century. Increased dependence on previously accumulated inventories abroad is the major factor in the decline.

Feed grain exports will likely total 12.5 million tons in 1961-62, near the high average of the past three years. In recent years, Western Europe has

A food demonstrator cooks a chicken soup prepared with American soybean ingredients at exhibit of the U.S. Food Fair in Germany.





Agricultural attache and assistants check quality of a grain shipment arriving in Tokyo from the U.S. Japan was the No. 1 market for American farm products in 1961, displacing the United Kingdom, which has been our best foreign market. Exports moved to 125 countries.

taken about three-fourths of U.S. exports of feed grains, and these exports will continue to benefit from the steady growth in the livestock industry there. A limiting factor on any further gain in feed grain exports this year, however, is the substantial increase in European production, particularly in France.

Rice exports in 1961-62 may be lower than those of the past two years, but above the 1955-59 average. Exports this year are likely to total 19-20 million bags (milled basis) compared with 21.6 million a year earlier. The reduction will be in exports under Government programs (P.L. 480 and P.L. 665) as dollar exports are expected to continue at the level of last year. The main reason for the decline is the continuing reduction in U.S. carry-over stocks of rice which has occurred since August 1, 1956. Stocks on August 1, 1961, were 15½ million bags (milled basis) less than in 1956.

Exports of animal products in 1961-

62 may be somewhat above last year's \$618 million. Increases are expected in hides and skins, poultry meat, and variety meats—all of which scored new records in 1960-61.

While the export volume of animal fats and dairy products is expected to increase, the value of these commodities is likely to decline because of lower average export prices. Large exportable supplies, along with lower prices, will encourage exports of most animal products in 1961-62.

Exports of oilseeds and their products, including large quantities of oils for overseas donation, are estimated to be about 20 percent above last year's \$603 million, with increases occurring in soybeans, vegetable oils, and protein meal. Continued relatively small exports of soybeans from Communist China to world markets will be a principal factor contributing to the increased demand for U.S. soybeans and meal.

U.S. exports of edible oils will be

helped by smaller olive oil crops in the key countries of Spain and Italy, as well as reduced exports of copra. Also, a strong demand for protein meal for feed in Europe will encourage U.S. exports.

Exports of fruits and vegetables are likely to be moderately above the levels of a year earlier, and the smaller production of deciduous fruits in Europe is expected to stimulate U.S. exports of fruits to that area. Also, exports of fresh and processed vegetables are expected to increase slightly this year.

Meanwhile, unmanufactured tobacco exports will probably be slightly below last year's 504 million pounds, due to increased competition from expanding production abroad, improved foreign stock positions, and the continued existence of trade barriers.

Dr. Tontz is Chief, Trade Statistics and Analysis Branch, Development and Trade Analysis Division, Economic Research Service.

TRENDS AND



Potato flakes from the research laboratories of the U. S. Department of Agriculture are market tested for consumer reaction. Well accepted, they are being produced commercially.

PROSPECTS FOR MARKET DEVELOPMENT

by WENDELL E. CLEMENT and WILLIAM F. HOOFNAGLE

AGRICULTURAL market development programs in 1962 and the years ahead will continue to be essential for an industry whose growth in capacity to produce has outstripped the growth in profitable markets. The need for market development in the future is directly related to farm output, population growth, and rates of consumption of agricultural products, especially those in abundant supply.

In the past decade, farm output increased 27 percent while population increased only 17 percent, and present indications appear to be that the gap between farm output and population growth will continue, as productivity per acre is expected to increase another 3 percent by 1965. Thus, the need for continued and perhaps increased attention to market development as one

means of helping to maintain a sound and healthy agriculture is evident.

Three principal approaches have been and will continue to be used in the area of market development. They are: Food assistance programs, promotion and merchandising, and development of new products and new uses of agricultural commodities.

Food assistance programs contribute to market development by enhancing consumption where lack of consumer income is a restraint on market expansion. The principal domestic food assistance programs currently in effect include the National School Lunch, Special Milk, Direct Distribution, and Food Stamp Program—the last on a pilot basis.

In addition to market expansion, these programs have as their goal improving the nutritional intake and well-being among underconsuming groups—low-income families, inmates of charitable institutions, and children in



Mr. Clement is a staff member of the Market Development Branch, Marketing Economics Division, ERS. Mr. Hoofnagle is Chief of the Branch.

schools, summer camps, and child-care centers.

Today, food assistance programs have been considerably strengthened over the first ones which were begun in the early 1930's with the passage of farm relief legislation. The first large scale donation of surplus commodities consisted of the distribution of about 100 million pounds of salt pork, acquired through emergency purchases, to needy persons.

In fiscal year 1961, direct cash grants to States for school lunch and special milk programs and the value of food donated for use in the lunch program, along with that donated to institutions and needy families, amounted to over \$485 million.

For 1962, further improvements in food assistance measures are in prospect. Great reliance will continue to be placed upon economic research to provide the basis for such improvements. Research will be aimed at measuring the impact of these programs on market expansion and determining how they can be applied more effectively for maximum benefit. This includes studies on such issues as factors influencing levels of participation in the programs by students and needy adults, and the extent of substitution of donated foods for those that would have been purchased in the absence of food assistance programs.

Merchandising, advertising, and other forms of promotion, as approaches in market development, are employed in creating awareness and to inform the buying public how they may use and benefit from the consumption or application of the promoted product. Currently, there are about 1,200 agricultural producer groups spending between \$70 million and \$100 million annually on promotional activities aimed at maintaining and strengthening markets for their products.

The Department's role in this area of market development is one of providing the various commodity groups with supporting marketing research.

Research studies are aimed at obtaining information that producer groups can use in appraising their programs, and in providing help to others who are considering the question of promoting. This research, as an aid to market development, will continue to be essential in the years ahead. Millions of consumers are climbing the income ladder so that discretionary spending power is becoming more widespread. Agricul-

tural groups probably will step up promotional activities to capture part of the market which this added income engenders. Well-planned and executed promotional programs can be important in upgrading of diets with increased demand for high-resource-using foods. Research can be used to help chart and direct these programs to make them most effective in achieving their objectives.

Further research is needed to establish basic factors which influence the responsiveness of a particular product to promotion stimuli. This information can be used in appraising the feasibility and the potential of promotion as a means of developing markets for specific products.

New products and product innovations are another important aspect of maintaining and strengthening markets for farm products. USDA has four regional research laboratories which conduct physical research to develop new or improved food products from agricultural origin. This work is given additional emphasis by market research programs carried out in conjunction with physical science research.

In this area, market research is aimed at aiding the physical science research by reflecting the kind of products consumers want in terms of price,

quality, convenience, and other factors.

It also pinpoints the economic climate in which the product must be sold, including channels of distribution and certain aspects of competitive products. Illustrative of accomplishments to come out of this program are potato flakes, super-concentrated apple juice, and frozen orange concentrate. Research has indicated that most product innovations have resulted in plus markets for the commodities involved.

Product innovation and development will continue to be stressed more in the future as a means of reducing the gap between production and consumption. Inroads that might be made by synthetics on the non-food market must be countered by the development of new products of better quality and of an agricultural origin. Also, research in the development of new food products will be continued and, perhaps, increased in tempo to meet the changing needs and demands of an increasingly affluent society.

Market development programs do not provide the complete answer to the problem of overcapacity in agriculture; however, in combination they represent a significant contribution toward an effective solution and help provide the basis for a vigorous, progressive agriculture.

Food assistance programs contribute to market development by enhancing consumption where lack of consumer income is a restraint on market expansion. Currently, more than 24 million people are benefiting from USDA's Direct Distribution Programs.



Closed Recirculation Method Is Best Way To

by CARL W. W. SORENSON

LONG AGO, many folks took insects in grain kernels as a matter of course.

They thought wheat, for example, wasn't fully cured and ready for bread flour until it was fairly "alive" with internal larvae; that these were a spontaneous, natural, and beneficial phenomenon in harvested grain.

But things have changed.

Today, we recognize stored-grain insects for what they are: contaminants, destroyers, and costly predators of valuable food and feed. And no one appreciates bugs in flour, any more.

That's why the U.S. Department of Agriculture, working with farmers, chemical companies, grain-storage builders and commercial storage firms, devotes a lot of effort in finding ways to keep grain and cereal products free of insects.

Latest among these efforts is a series of tests conducted by the Agricultural Marketing Service to compare fumigant distribution and insect "kill" by three common fumigation methods—gravity penetration, single pass of the fumigant, and closed recirculation.

In each trial, the closed recirculation method was found most satisfactory.

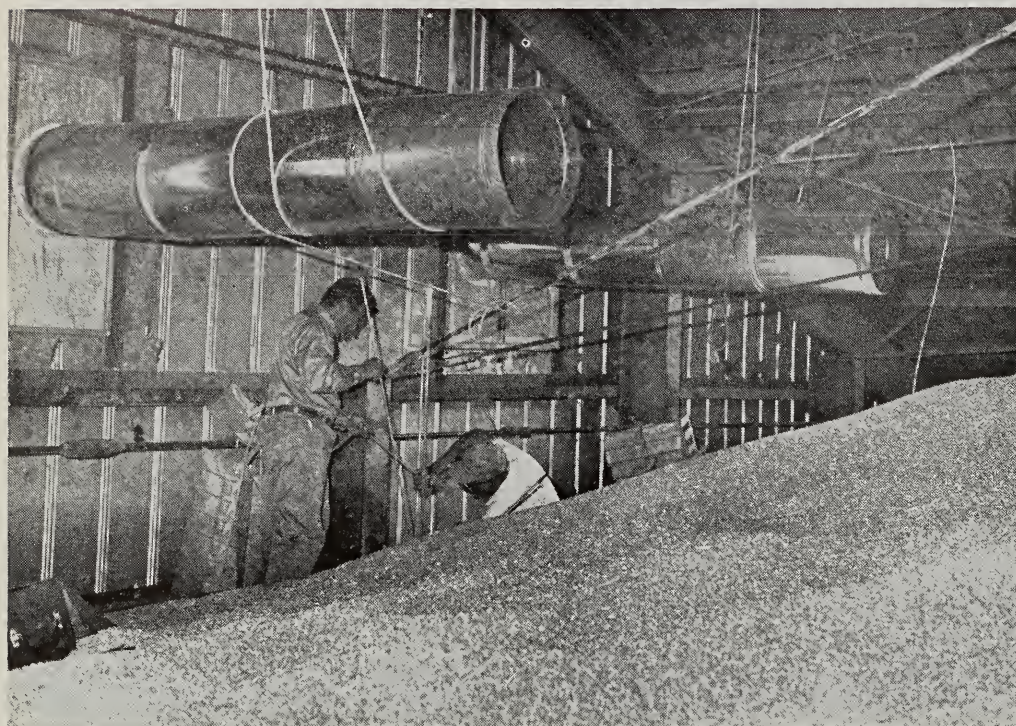
This method of fumigation isn't particularly new—AMS's Stored Products Insects Laboratory, Manhattan, Kans., ran closed recirculation trials in 1953—but, storage structures used in the early tests were a conglomeration of designs, not suited for accurate comparisons.

The last research, also conducted by the Manhattan laboratory, involved identical flat-storage, 100,000 bushel structures, designed by two major grain bin manufacturers.

The tests, run at various wheat-storage sites in Kansas, were designed to answer some basic questions:

Are single pass fumigations practical in flat storages having a wide range of air movement throughout the grain mass?

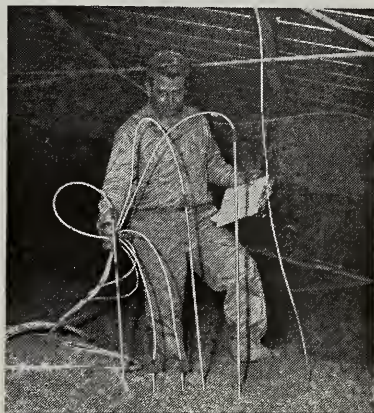
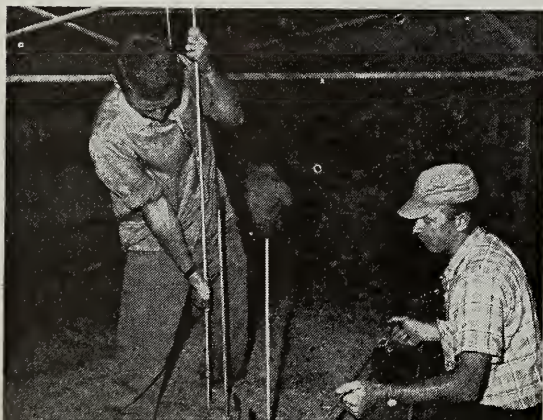
The author is a staff member of the AMS Marketing Information Division, Southwest Area, Dallas, Texas.



Return ducts inside storage structures take vaporized fumigant back to fans for recirculation by regular aeration system in flat storage structure in Woodston, Kansas.



Test insect points (holding live insects) are attached to bottom section of each probe before they are inserted to depths of 2½, 5, 10, 15 feet, and floor levels.



Kill Stored-Grain Insects

Would simple gravity penetration fumigations, even of gaseous fumigants, produce a higher "kill" of insects?

Would the addition of return ducts that permit recirculation of the fumigant vapors materially increase effectiveness, even in grain storages having uneven air flows?

Heretofore, answers to these questions were unproved.

In conducting the trials, fumigants were applied as follows:

Gravity Penetration—The entire fumigant dosage was released into the overhead space, above the wheat surface, through a series of plastic application lines fitted with nozzles. Distribution by this method is obtained by the natural downward flow of the fumigant.

Single Pass—90 percent of the fumigant dosage was released directly into the aeration ducts and pushed up through the grain mass. Access doors in each end of the building were left open during operation of the fans, then sealed after the fans had been stopped. The remaining 10 percent of the total dosage was then released into the space above the grain surface.

Closed Recirculation—The entire dosage of methyl bromide was released through nozzles suspended above the wheat surface. The air-gas mixture was drawn from the overhead space through return ducts attached to the aeration fans and pushed by the fans through the wheat mass. The fans were operated for one hour.

"Results were boiled down to single comparable figures that clearly demonstrate the superiority of the closed recirculation method," says Charles L. Storey, entomologist in charge of the project.

By this method, the fumigant was forced into hard-to-get-to spots in the grain mass; by actual count, insect mortality was greater; and additional costs of the return ducts were more than offset by increased effectiveness.

Safety of application was increased, too, because workers did not have to enter the bins, sealed during treatment to minimize loss of the fumigant, during the closed recirculation treatment.

Methyl bromide (with 2 percent chloropicrin added as a warning agent) was the chemical used, at a rate of 2 pounds for each 1,000 cubic feet of space, in all cases.

Adult confused flour beetles and immature rice weevils in cages containing wheat were placed in the grain mass at 2½, 5, 10, 15 feet, and floor levels in each of 20 locations in the bins. That gave 100 different spots in each bin for checking. In addition, control insects were subjected to similar temperature and moisture conditions by placing them in adjacent untreated buildings.

Mortality counts on the adult confused flour beetles were made immediately after the 24-hour period, and two weeks later; mortality of the immature rice weevils, in the grain, was checked at six weeks after the trials.

Concentration of the fumigant at all 100 points was checked at 1-, 4-, 8-, and 24-hour intervals after the chemical was volatilized through 12 nozzles in the overhead space.

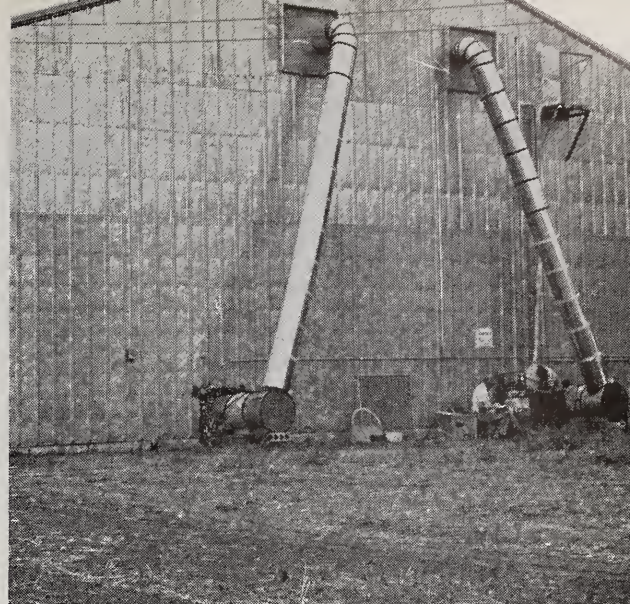
WHERE did the fumigant go? Special equipment to measure concentration of the fumigant was attached to the 100 probes in each bin. That told most of the story.

The fumigant couldn't be effective unless it penetrated the grain mass, in lethal amounts, to all points of the bin.

But the real proof in favor of the closed recirculation method stands in the counts of dead insects. Compare these average rates of mortality obtained in two types of flat storage by the three different methods:

PERCENT OF INSECT "KILL"

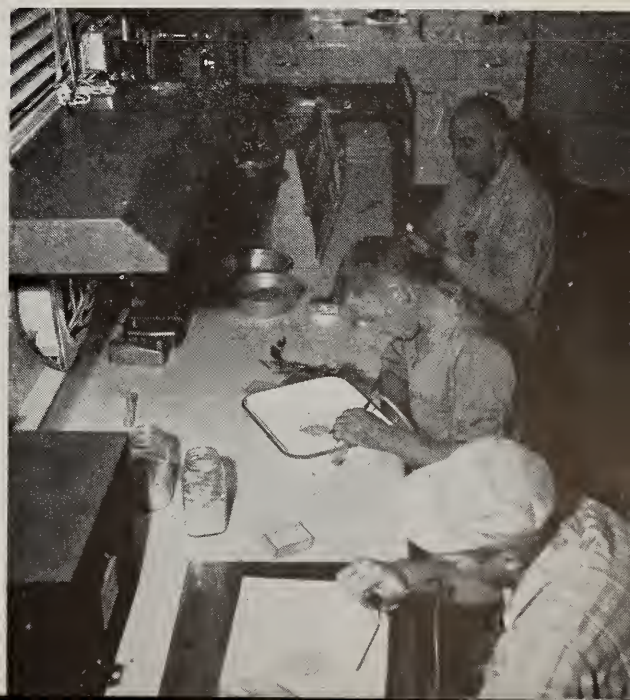
Flour Beetles		Rice Weevils	
Bin A	Bin B	Bin A	Bin B
Gravity penetration:			
76.9	54.8	83.6	67.6
Single pass:			
85.7	80.6	96.7	90.8
Closed recirculation:			
99.2	100.0	99.7	99.9



Flat storage structure equipped with return ducts for closed recirculation fumigation method. Ducts draw volatilized fumigant from inside building down into regular aeration fans for recirculation through grain mass.



A project leader checks instrument readings to determine concentration of methyl bromide at each of 100 check points. At the lab, researchers make mortality count of insects to check effectiveness of each fumigant.





A buying scene at tobacco sales auction in southern Rhodesia. Because of low-cost labor Rhodesia can undersell us in competing markets.

U.S. Faces Stiff Competition from Rhodesia in World Tobacco Markets

by STEPHEN E. WRATHER

HISTORICALLY, the United States has been the world's leading producer and exporter of tobacco. We now export about two out of every five acres of our flue-cured tobacco, which is the leading export type.

However, our share of world production and trade in tobacco has been declining for a long number of years. Competition in the export market has

The author is Director, Tobacco Division, Agricultural Marketing Service, USDA.

steadily grown keener, and U.S. tobacco growers are becoming increasingly aware of competition from other producing areas, particularly Rhodesia.

Since the end of World War II, Rhodesia has become the second most important world supplier of flue-cured tobacco, and a most formidable competitor to the United States.

Rhodesia is a part of the British Commonwealth, consisting of the Federation of Southern Rhodesia, Northern Rhodesia, and Nyasaland. It is situated

in south central Africa within the tropics, and south of the Equator. Its population is about 7 million, of which one-quarter million are Europeans, mainly British.

Tobacco production in Rhodesia started in 1911, but its prosperity was somewhat checkered until after World War II.

The United Kingdom is the world's leading importer of leaf tobacco and in this capacity has played a prominent part in the expansion of tobacco pro-

duction in Rhodesia by making substantial and sustained annual purchases. Also, Commonwealth countries enjoy a duty preference on tobacco, which gives Rhodesian tobacco a price advantage in the United Kingdom market.

Right after World War II, the United Kingdom, faced with a shortage of dollars, increased their purchases of Rhodesian tobacco, which could be bought with Pound Sterling. The British reached an agreement with the Rhodesians, beginning in 1948, guaranteeing the annual purchase by the United Kingdom of specified minimum quantities of flue-cured tobacco. These agreements have continued, and the quantity which they purchase has been increased considerably.

This purchase arrangement, combined with the protection afforded by the price support on U.S.-grown tobacco, has been an effective incentive for the Rhodesian grower. Production of flue-cured leaf has increased from an average of 28 million pounds annually for the 1935-39 period to 237 million pounds in 1961.

About 90 percent of the production is exported. Of course, Rhodesia grows other kinds of tobacco, but this story is concerned mostly with flue-cured.

From the standpoint of soil and climate, the United States has an advantage over Rhodesia in the production of tobacco. Our tobacco enjoys a worldwide reputation, particularly due to its flavor and aroma. However, British purchases, price of competing tobacco and other considerations, have contributed to the expansion of Rhodesian exports.

Tobacco is characterized by high labor requirements, and Rhodesia enjoys a production advantage particularly from the standpoint of an abundance of relatively low cost labor. Consequently, profitable prices for Rhodesian tobacco production are somewhat below profitable prices for U. S. production.

Another important consideration—perhaps the most important—in the Rhodesian tobacco picture is leadership. Flue-cured tobacco in Rhodesia is grown on approximately 3,000 large estates. Average acreage per farm or plantation is now about 75, with a total acreage

of about 230,000. In the United States we have 713,000 allotted acres and 205,000 allotments.

By virtue of the small number of tobacco growers involved, organizational and educational efforts in Rhodesia present an interesting contrast to the situation in the United States. In that country tobacco is the most important export commodity, and in this capacity makes a strong contribution to foreign exchange and trade. It also follows that Rhodesian tobacco producers constitute the most important group in the country.

Under these circumstances they have developed an outstanding organization, the Rhodesian Tobacco Association. Under the auspices of this association the growers have purchased, and are largely responsible for, the operation of a well-equipped experiment station. At this station a number of basic research projects are well established. Again—returning to the numbers involved—there is a high degree of grower participation in the findings and recommendations of the researcher. The fact that the grower organization is the promoter of the experiment station and, consequently, the research projects, may well be a factor in grower acceptance of research findings.

During a visit to Rhodesia I was impressed by the leadership which the Rhodesians have in their tobacco affairs. I was convinced that the leadership is

well informed, and that they are pursuing advantages, market conditions, and so on, in a judicial manner. One other example of the reflection of this leadership is the Tobacco Export Promotion Council which operates under the auspices of the Rhodesian Tobacco Association.

Without attempting to outline this organization's functions, I would only say that, in my opinion, the Tobacco Export Promotion Council is an appropriate title. During my visits to the experiment station, and with growers, I was convinced that the last chapter in the progress of Rhodesian tobacco production had not been written. In this connection, perhaps we should point out that acreage yields in the past 10 years have increased from around 600 pounds to slightly more than 1,000 pounds per acre.

The average market price for Rhodesian tobacco is about 40 cents a pound, while the current market price in the United States is about 64 cents. The British buy the better qualities and pay prices somewhat comparable to those prevailing in the United States. However, because of the duty preference for leaf tobacco, it actually costs manufacturers less than U.S. leaf. The remainder of the crop sells for relatively low prices, compared with our tobacco, thus the Rhodesians undersell us by a large margin in other competing markets.

FLUE-CURED TOBACCO—RHODESIA AND NYASALAND

Year of Harvest	Acreage (1,000 acres)	Yield (lbs. per acre)	Production 1,000,000 lbs.	Market Price (U.S. cents per lb.)
1935-39	50	568	28.4	12.1
1947-51	148	615	91.1	38.7
1955	190	701	133.2	47.1
1956	195	914	178.3	38.4
1957	190	781	148.6	45.9
1958	214	730	156.0	42.2
1959	220	886	195.2	40.0
1960	213	1,044	222.4	39.9
1961 (1)	230	1,030	237.0	39.5

Source: Tobacco Division, FAS

Improving methods and equipment for processing

READY-TO-COOK CHICKENS

by REX CHILDS and JOHN A. HAMANN

IN THE MANY processing steps necessary to prepare whole ready-to-cook chickens, the most costly operation is evisceration. The cost of labor for this work exceeds the combined labor costs for all other plant operations. Despite its prominence in plant operating costs, there has never been an exact time value or a precise description developed for the most efficient methods of performing the many processing steps on the eviscerating line.

With this need in mind, marketing researchers of the U. S. Department of Agriculture, in cooperation with the University of Georgia's Experiment Stations, conducted studies to improve methods, equipment, and facilities for processing ready-to-cook chickens. Their studies involved an exact determination of labor and equipment required for present methods, as well as the development and testing of improvements under industry operating conditions.

Modern poultry processing plants prepare from 40,000 to 100,000 ready-to-cook chickens a day, and at rates varying anywhere from 70 to 200 birds a minute. Naturally, this involves many man-hours of processing labor.

At these production rates, the use of methods that result in loss of edible product, that include wasted motions or periods of intermittent idleness, can rapidly become a critical drain on plant income.

USDA engineers went about the business of spotting method weaknesses through analysis by micro-motion time studies. Each step in the eviscerating process was photographed with a constant speed motion picture camera using "fast" film. Since each frame of the film represented an exact time value, a tally of frames converted into time produced labor requirements accurate to one-thousandths of a minute.

This made it possible to accurately dissect operations requiring as little as one and a half seconds into component parts such as "reach," "grasp," "cut,"

The authors are staff members of the Transportation and Facilities Research Division, Agricultural Marketing Service. Mr. Childs is stationed at Athens, Ga., and Mr. Hamann is in Washington, D. C.

and "release." By studying and evaluating each operation in the eviscerating process in many plants, the best of many good methods were determined, and improvements were developed.

Preliminary analysis of the findings shows that many operations can be performed faster or more effectively if:

1. Shackles on the eviscerating line conveyor are spaced sufficiently far apart to avoid "search" and "fumble" time;

2. The lighting is of proper intensity and comes from the right direction, reducing eye fatigue and "search" time;

3. The carcasses are steadied by guide rails, keeping birds in a continuous fixed position and the "reach" constant;

4. A spray rinse (properly positioned in the work area) for hands and utensils is used, instead of a solid stream of water; a greater area of soiled surface is covered, and less time is required for rinsing; and

5. The work station is laid out to keep hand movements to a minimum, and "reaches" as short as possible.

Also, it was found that operations can be performed with less loss of edible product if:

1. The cutting motion for removing the preen gland is an upward stroke; a tendency to drag the knife blade (downward stroke) deep into edible tissue is avoided;

2. The layer of abdominal fat is held in place during removal of viscera; once dislodged, it is free to fall into waste disposal flume; and

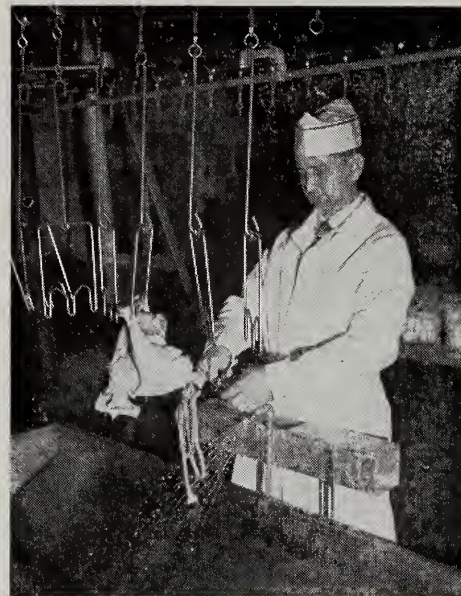
3. Gizzards are not allowed to roll and tumble on peeler rolls, stripping off outside fat.

Better workmanship results if:

1. Hand rinse is within convenient reach; convenience encourages frequent use, resulting in lowering chances for product contamination;

2. Lighting is adequate as to intensity and direction, the possibility for oversight is greatly reduced; and

3. Good crew balance is maintained so that some workers are not required to work at a maximum pace for long periods of time.



Improvements in hand motion patterns and work station layouts are closely checked in laboratory trials. Below, guide rails steady the bird for the plant operator.



Sudden rapid motions are recorded easily by motion picture camera using "fast" film.



A New Step Toward Quality Grape Exports



A German youngster is tantalized by American grapes on exhibit at the U. S. Food Fair 1961, which was held several months ago in Hamburg.

by FLOYD F. HEDLUND

IS IMPROVED quality the key to increased sales of American grapes in foreign markets? Growers of Emperor grapes are convinced it is, and they have taken steps to make sure quality grapes represent us overseas.

The grape growers can now point to the establishment of minimum quality requirements for Emperor grapes going into the export market. The industry worked with USDA in setting up these standards.

The regulations were issued by the Department under the newly enacted "Export Grape and Plum Act." Passed by Congress at the request of growers, this Act is designed to prevent shipment of low-quality grapes and plums to foreign markets.

The story behind the Act dates back to pre-World War II days when the European fresh market was the major overseas outlet for American-grown table grapes and plums. Between 1934 and 1938, the United Kingdom alone imported an annual average of 1,800 tons of our fresh plums and 7,120 tons of our table grapes.

But the post-World War II period brought severe reductions in these overseas shipments. Import restrictions were

imposed on American fruit due to a shortage of trading dollars.

In 1959, the trade door was reopened when the United Kingdom liberalized the import requirements for fresh deciduous fruits. However, exporters found there were new problems to face.

In the restored market, competition from other nations was exceptionally strong. Post-war conditions had encouraged other European countries such as Italy, South Africa, Spain, Greece, Turkey, and France, to plant large acreages of fruit. They concentrated on shipping their highest quality fruit to the European fresh market, their principal trade outlet.

The U. S. fruit industry soon realized it must not use foreign markets to get rid of inferior quality products. Not only was the U. S. reputation at stake, but also the opportunity to trade in foreign markets was challenged.

Under the Export Grape and Plum Act, the U. S. Department of Agriculture can establish minimum quality standards and other requirements necessary to regulate exports of European-type table grapes and plums. It also provides that when such regulations are in effect, those varieties covered must be inspected and certified as meeting these regulations.

The regulation recently issued for Emperor grapes is the first to come out of this now working partnership between the industry and USDA. The

regulation applies to any shipment of Emperor grapes exceeding 25 packages or 1,250 pounds gross weight.

It prescribes the U. S. No. 1 Sawdust Pack grade as the minimum for Emperor grades in sawdust packs, and the U. S. No. 1 Table Grape grade for fruit in other types of pack. Packages must be marked with the name of the grower or packer, the variety, and the name of the U. S. grade. Grapes must be inspected and certified by the Federal-State Inspection Service as meeting the minimum requirements within 14 days of export.

Exporters are required to furnish export carriers with a copy of the inspection certificate for each shipment bound for a foreign destination. And carriers must retain these certificates on file for three years following the date of export.

The plum industry has recommended that, as long as most of our plum production is regulated under marketing agreements and orders (which limit shipments to the better grades), there is no need for further regulation under the Export Grape and Plum Act.

So far, the grape regulations are limited to the Emperor variety which comprise 85 percent of our grape exports. Growers of Emperor grapes now believe that the new regulations will assure shipment of a higher quality product, and result in stronger sales in overseas markets.

Mr. Hedlund is Director, Fruit and Vegetable Division, Agricultural Marketing Service.



An AMS Packers and Stockyards Branch representative audits the records of a large midwestern livestock auction market to make sure that provisions of the Packers and Stockyards Act are being observed. Keeping proper books and records is "plain good business."

Record Keeping—

by EARL W. SHERMAN

IF YOU ARE in the business of buying and selling livestock, you may have found—as has any successful businessman—that a good, sound system for keeping records of your transactions can be a real working tool in the management of your business—be it large or small.

For the dealer who buys and sells livestock in interstate commerce, keeping proper books and records is not only "plain good business," but it is a requirement under the Packers and Stockyards Act as well.

Proper record keeping is just one of the protective requirements prescribed under the P&S Act. Administered by the Packers and Stockyards Division of AMS, the Act is designed

with the objective of maintaining fair and ethical business conduct and free, open competition in the livestock and meat marketing industries.

Although the record-keeping requirements of the Act are quite broad in scope, a dealer's records may be kept on a fairly simple basis and still comply with the law. However, it is made clear in the Act that his records must, in every case, "fully and correctly" disclose all details of his livestock transactions.

To illustrate how a dealer might keep proper records, let's look in on W. C. Smith's livestock buying and selling activities under the P&S Act.

Smith, a livestock dealer doing business in interstate commerce, has just purchased 12 steers from the Centerville Auction Co. at a total cost of

\$2,940. Since the transaction has just occurred, he knows it is best to make the necessary entries in his purchase and sales journal right away.

In the "purchases" section of the journal, he records the date of the purchase, the person or firm from which he has made the purchase, the number of head and kind of livestock, the total weight, the price per hundredweight, and the total cost of the purchase.

To the Brand Packing Company, Smith sells the 12 steers at a price of \$2,958.64. Again he makes an entry, this time in the "sales" section of the journal. He records the date of the sale, the name of the buyer, the number of head and kind of livestock sold, the price per hundredweight, the total price, and any yardage, trucking, or commission fees he has had to pay. To make

DATE	PURCHASED FROM	DATE PAID	HEAD	KIND	WEIGHT (LBS.)	PRICE PER CWT.	AMOUNT
1962							
1-7	Centerville Auction Co.	1-7	12	Steers	12,000	\$24.50	\$2940.00
1-8	High Auction Co.	1-8	22	Calves	6,600	26.25	1732.50
1-10	Ocean L.S. Auction	1-10	32	Mx Feeders	17,640	20.25	3572.10



An AMS Packers and Stockyards Branch auditor checks the records of a selling agency at a livestock terminal market. At right, side view of cattle being unloaded from producers' trucks at loading docks to the rear of the Gainesville, Florida, livestock market.

An Important Job of the Livestock Dealer

these entries, of course, he needs to obtain an itemized listing of all charges made in connection with the transaction.

In this manner of recording his purchases and sales, Smith is able to enter his beginning and ending inventories and to determine his profit and loss each week.

At the same time, should an accountant with the Packers and Stockyards Division wish to check Smith's accounts to see that the financial condition of his business is sound, the records will "fully and correctly" disclose the true nature and details of his livestock transactions, as the Act requires.

In addition to keeping a daily record of his purchases and sales, Smith keeps — as required under the Act — any books, documents, or papers that "con-

tain, explain, or modify" transactions in his livestock business. In other words, he keeps in an orderly file all copies of accounts of sales, accounts of purchases, scale tickets, invoices or bills, sales slips, bank statements, deposit slips, and any other receipts or billings he has issued or received in his livestock buying and selling activities.

Smith also keeps a check register, a cash receipts journal, and a general ledger accounts book. He uses the latter book for recording all his general accounts, such as cash in the bank, accounts and notes receivable, fixed assets, accounts and notes payable, and taxes payable.

Such a system of spending just a few minutes a day for filing receipts, billings, and other incoming papers and for making the necessary entries

in his books will equip the livestock dealer with a greater knowledge of his business and will indicate his current financial condition.

Even more important, with respect to a dealer's requirements under the P&S Act, it will enable him to make the required annual report of his livestock business operations to the Packers and Stockyards Division and avoid possible violations of the Act.

Livestock dealers may get more complete information on record-keeping under the P&S Act by writing to the Marketing Information Division, AMS, USDA, Washington 25, D. C., for a copy of PA-482, "The Packers and Stockyards Act As It Applies to Books and Records of Livestock Dealers."

The author is an auditor in the Packers and Stockyards Division, AMS.

DATE	SOLD TO	DATE PAID	HEAD	WT. KIND (LBS.)	PRICE PER CWT.	AMOUNT (GROSS)	YARDAGE TRUCKING	COMMISSIONS
1962								
1-7	Brand Pkg. Co.	1-7	12 Steers	11,930	\$24.80	\$2958.64		
1-11	Cattle Sales Co.	1-11	22 Calves	6,560	26.50	1738.40		\$11
1-11	John Brown	1-11	32 Mx Feeders	17,640	20.75	3660.30		

THE CHANGING MARKET



WALKING COSTS MONEY

Unnecessary walking in wholesale fruit and vegetable warehouses takes time and costs money, according to AMS marketing researcher Robert K. Bogardus.

To illustrate, let's ask a couple of questions: How many trips do your employees make to unload a truck or a railroad car? How many trips does it take to deliver orders to a customer's truck?

Well, for instance, a carload of apples weighs approximately 20 tons and contains 800 boxes that weigh close to 50 pounds each. If stevedore-type 2-wheel handtrucks carry 6 boxes on each trip from the railroad car to storage, that means 268 trips are required to unload one carload.

One hundred and thirty-four trips would be made to storage with loaded equipment, and 134 trips would be made with empty equipment returning to the car for another load. If the distance traveled from car to storage is 100 feet, then your men would walk a total of 26,800 feet. The walking part of the job will take about 2 man-hours and would cost you \$4 per carload if

you pay \$2 an hour for your labor.

But—you can cut the amount of walking from 26,800 feet to 4,000 feet—the time spent walking from 2 man-hours to 22 man-minutes, and the cost from \$4 per carload to 74 cents, by using 4-wheel handtrucks. A 36- by 54-inch 4-wheeler can carry 40 packages per trip. Only 40 trips would be necessary for a carload of apples, instead of the 268 trips with 2-wheel handtrucks.

The point is that the materials handling equipment that can handle larger loads will require fewer trips to unload a carload of produce than will the smaller equipment. Reduced walking not only cuts unloading costs but also makes time available for other work.

Incidentally, the same principle will apply to delivering orders to customers' trucks. For a small order, use a 2-wheel handtruck. It will be easier, and faster. However, for large orders have your workers use a 4-wheel handtruck to cut down the number of trips.

This should be pointed out to your salesmen and shipping clerks. Have them remind the men who are filling orders to pick the equipment needed for each customer's order. Remind them that, for up to 6 packages per order, to use a 2-wheeler; and for more than 6 packages, a 4-wheeler. *By saving walking time, you will save money.*

GRADING WOOL

A market pricing system geared to quality may give wool producers a new boost in their competitive position, according to economists of the Economic Research Service.

In the struggle to maintain their share of the U.S. market, American wool growers have been losing ground. This is because the demand for domestic wool has been steadily reduced by

greatly increased supplies of much-improved, man-made fibers, and the competition from better-prepared, imported wools.

The practice now in many local markets is a minimum of grading with buying mostly on a flat price basis regardless of quality. This, of course, doesn't encourage improvement in either production or processing when there are no premiums for the better wools. Better quality and value information and higher prices for quality wools will transfer the desire for improvement to the producer.

Also under the present system, yield, one of the most important quality-value factors, is ignored. Slight changes in yield, the scoured wool expressed as a percentage of the grease wool, can result in much larger fluctuations in the unprocessed wool value. Prices now are paid on a raw basis with no attempt to measure actual yield first while price quotations are on cleaned wools.

In addition, relating price to quality should stimulate more efficient marketing. Selling on description with uniform standards encourages the assembling of lots of uniform quality which buyers like. Also, there is less re-grading or re-sampling. This simplifies handling and merchandising and can reduce marketing costs. Accurate information on quality and value will also make price quotations more useful.

Whether or not such a wool classification system is usable depends on several factors. They include the supply of wool available for sampling, its type and uniformity, the ability of the sampler, accurate testing equipment and methods, handling and conditioning used and a correct means of identification.

Adequate market information will be an important means of utilizing the results of the new classification system

- Walking Costs Money in Wholesale Warehouses
- A Market Pricing System Geared to Wool Quality
- Malathion Prevents Infestation in Stored Shelled Corn
- One Man Handling Unloading Equipment Cuts Costs

and assist producers in bargaining with buyers. Such information would include the prices of the various qualities in local and central markets as well as the supplies of wool on hand.

If American wool producers are willing to accept such a system of quality classification and improve their product, domestic wools may well regain some, if not all, of their lost market-share.

MALATHION FOR CORN

After a five-year stretch of testing, AMS marketing researchers have found that premium-grade malathion is the most effective and cheapest insecticide of those that may now be used to prevent insect infestation in stored shelled corn in the midwest corn belt.

They have also discovered that malathion does not affect the odor or flavor of bread made from treated wheat, nor does it impair the germination of seed.

Applied at the time of storage, malathion spray or dust will effectively protect corn for a full season's storage.

Here is the procedure researchers of the Agricultural Marketing Service recommend when spraying with malathion:

Use an emulsifiable concentrate of 57-percent premium-grade malathion at the rate of one pint in 2 to 5 gallons of water for each 1,000 bushels of corn.

Use good spray equipment, calibrated for exact rate of delivery to insure uniform distribution of the spray. The amount of water, operating pressure of the pump, and size of the nozzle opening will vary, depending on the rate of grain flow. The key measurement is one pint of malathion concentrate for 1,000 bushels of corn.

They urge caution to avoid spraying with a fine mist which will drift away. A low nozzle pressure should be used, with the nozzle shielded against wind and air currents.

Also, malathion spray is preferred to malathion dust by many because the spray is easier to apply and will not add to the dust content of the corn.

The recommended treatment for dusting, though, is a 1-percent premium-grade malathion powder at the rate of 60 pounds per 1,000 bushels of corn. The dust should have an organic base, for dust with an inorganic base could lower the grade of corn.

AMS researchers insist that only the premium grade of malathion be used, as it is more highly refined than the agricultural grade used for field applications.

During the first few weeks after treatment the amount of malathion decreases rapidly. The rate of loss then levels off and sufficient malathion remains to provide adequate protection for stored corn throughout at least one storage season. The rate of deposit is well under the tolerance limit of 8 p.p.m. set by the Food and Drug Administration.

If insect infestation reappears in long-term storage, malathion can be reapplied without exceeding the tolerance.

High-moisture content or high temperatures shorten the protection period for corn in storage. A temperature of 90 degrees F. and 13-percent moisture content are the top limits for stored shelled corn.

ONE MAN AT A TIME

Getting a job done quickly has its advantages—but added speed loses its value when its cost exceeds the time saved.

Here's one instance, in particular, which concerns unloading a carload of grapes. It's true that four men can do that job faster than one man, but the prices paid for speed are high. When

four men unload a car of grapes by building stacks of lugs on skids, pallets, or 4-wheel handtrucks, they take about one hour and 8 minutes from the time they begin until they finish the job. One man doing the same job would take 1½ hours. That's 22 minutes more elapsed time than the 4-man crew would take.

Now, let's see how much it costs to speed up this simple job of stacking lugs on handling equipment:

The four men would accumulate a total of 4½ man-hours. At \$2 an hour that's \$9 for this part of the job of unloading a car of grapes. On the other hand, one man, accumulating 1½ man-hours would be paid only \$3 for stacking the same number of lugs as the 4 men.

Therefore, while 4 men would take 22 minutes less time to do the job, the cost would be \$6 more. Is the added speed worth it?



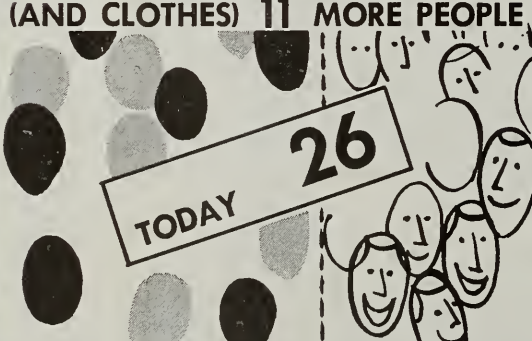
AMS marketing researcher Robert K. Bogardus has found that in most cases the cheapest way to get this type of job done is to use one man at a time. In loading any handling equipment—whether it's lugs of grapes or any other commodity, for that matter—one man can do the job at less labor cost than 2, 3, or 4 men. The work of 4 men costs three times as much as that for one worker; three men cost 2¼ times as much as one worker, and 2 men 1½ times the cost for one.

What is the reason for this? The answer is simple enough: When 2 or more men work in the same location and try to load the same piece of equipment at the same time, they can't help but get in each other's way. So, the more men, the most interference and the higher labor cost. By assigning one man to load handling equipment in the carrier, you can hold down the cost of these labor-hungry jobs,



FOOD is a BARGAIN HERE'S WHY

COMPARED WITH 1947-49

 <p data-bbox="669 957 999 1085">EACH FARM WORKER GROWS 80% MORE</p>	 <p data-bbox="1197 957 1544 1117">EACH FOOD INDUSTRY WORKER TURNS OUT 33% MORE</p>
 <p data-bbox="487 1340 999 1415">ONE FARM WORKER FEEDS (AND CLOTHES) 11 MORE PEOPLE</p> <p data-bbox="578 1468 883 1649">TODAY 26</p>	 <p data-bbox="1049 1340 1528 1468">FARMERS' PRICES FOR FOOD PRODUCTS DOWN 13%</p>

U. S. Department
of Agriculture
December 1961

The United States Department of Agriculture for 100 years has contributed to the Miracle of Food by finding ways to increase farm efficiency and conserve natural resources, working with the food industry to improve processing and distribution, creating new forms of food, and inspecting and grading food on its way to the retail store.